DATA ON USSR EXTRACTIVE INDUSTRIES

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I. CHEMICAL INDUSTRY

General

AUTOMATION IN USSR CHEMICAL PLANTS -- Moscow, Planovoye Khozyaystvo, No 4, Apr 58, p 91

Considerable work on modernization of technology and automation of processes is contemplated for the chemical and gas industry of the Tula Economic Region. The Technical-Economic Council of the sovnarkhoz, in cooperation with the Ministry of Chemical Industry USSR, the scientific-research institute, and the construction bureau, has worked out measures for the complex automation of the Stalinogorsk Chemical Combine and the Yefremov Synthetic Rubber Plant. It is planned to install here the latest instruments for automatic universal systems and machines for automatic registration which will carry out calculation, registration, and control of technological processes without the need for operators.

Of great importance will be the conversion of the Stalinogorsk Chemical Combine to natural gas, which will dispense with the necessity for bringing in coke from considerable distances. This will make it possible to free a considerable quantity of heavy fuel, will result in an annual saving of more than 100 million rubles, and will allow an increase in nitrogen fertilizer production at minimum cost.

EXPANSION OF KAZAKH CHEMICAL INDUSTRY URGED -- Alma-Ata, Kazakhstanskaya Pravda, 8 Apr 58

Kazakhstan is in a position to become a huge raw material base for the production of sulfuric acid, but at present, only the Ust'-Kamenogorsk Lead-Zinc Combine is putting out sulfuric acid. It is necessary to plan for the production of this product also at the Balkhash, Dzheskazgan, Karsakpayskiy, and Irtysh plants.

In the Karaganda Economic Region, coke-chemical production is being developed and a petroleum refinery is being built. Future plans should, therefore, also include the construction of two plastics plants.

SHARE OF CHEMICAL OUTPUT IN LENINGRAD REGION PRODUCTION -- Leningradskaya Pravda, 16 Apr 58

The enterprises of the Chemical Industry Administration of the Leningradskiy Sovnarkhoz produced approximately 8 percent of the entire output of the Leningrad Economic Region. During 1957, these enterprises fulfilled the plan ahead of schedule and increased output by more than 10 percent.

In 1957, the Okhta Chemical Combine installed and mastered the operation of a tubular polymerizer, which has permitted a 25-percent increase in the capacity for polyethylene production.

NEW WORKING TIME AND WAGE RATES -- Moscow, Komsomol'skaya Pravda, 22 Apr 58

Based on the decision of the 20th Congress of the CPSU concerning the transfer of workers and employees to a reduced working day and the regulation of wages, the Central Committee CPSU, Council of Ministers USSR, and VTsSPS (All-Union Central Council of Trade Unions) have considered it necessary to convert, in 1958, to the 7- and 6-hour working day and, at the same time, to regularize wage rates of workers and employees in enterprises and experimental organizations of a number of branches of heavy industry. Most branches of the industry in the chemical industry will be changed over during the period July 1958-September 1959. Chemical enterprises of the defense and tire industries will be converted during May-October 1958.

Coke Chemicals and Petrochemicals

NEW DE-EMULSIFIER DEVELOPED -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 18 Apr 58

Engineers of the Syzran' Oil Refinery have suggested an effective de-emulsifier from a thio salt, developed at the Kashpirskiy Shale-Processing Enterprise. The use of sulfosodium de-emulsifier at the Syzran' and other oil refineries has demonstrated its high effectiveness.

Gosplan RSFSR has made the decision to construct in the Kashpirskiy Mine region a new shale-processing plant which will produce the de-emulsifiers OP-10 and OP-7 in quantities sufficient not only for the Kuybyshevskiy, but also for other economic regions of the country.

Plastics

SHORTCOMINGS AT OKHTA PLANT CRITICIZED -- Moscow, Pravda, 14 Apr 58

The chemists at the Okhta Chemical Combine in Leningrad have mastered the production of three varieties of epoxy resins. However, despite their successes in mastering the production of new synthetic materials, the workers at the combine would be able to do considerably more if they received active support in their undertakings.

In the production of epoxy resins, for example, the capacity of the enterprise will already permit it to put out five times as much as it now produces, but up to now the supplier of raw material, located in Ivanovskaya Oblast, has sent material in insufficient quantity and of inferior quality.

At the combine it is well recognized that the creation of methods to produce polyethylene is only part of what needs to be done. It is also important to provide for processing the material into specific types of articles. To accomplish this, the reprocessing shop is being equipped; however, Glavleningradstroy (Main Administration for Construction of Leningrad Enterprises) failed to meet its deadline for construction of the shop in 1957. A step-up in the tempo of the work is not evident even now.

Many difficulties will have to be overcome by the chemical workers of the combine in order to obtain the necessary equipment. In polyethylene production, the new reactor equipped with an agitator will not go on stream until the end of 1958. It will permit an increase in productivity of the apparatus to at least ten times the present level. But this should have been accomplished a great deal sooner. The Ministry of Chemical Industry, which does not have its own chemical machine construction base, has not been in a position during the past few years to supply the combine with this complex equipment. Only after the Leningradskiy Sovnarkhoz had been established was it possible to assign the manufacture of these apparatuses to a local plant. Workers at the combine have requested the creation in the country of specialized chemical-machine construction enterprises which would be able to keep chemical enterprises supplied with all the required equipment.

The results achieved by the combine in producing new materials make the expediency of maintaining in its wide nomenclature stages of production which have for a long time been mastered or are even partially obsolete seem doubtful. Must it be considered normal that almost one third of the gross output at the enterprise now consists of celluloid and celluloid toys? It is high time that the Ministry of Chemical Industry USSR consider a more effective utilization of the capabilities of the Okhta chemical workers.

MOSCOW AREA DEFICIENT IN PLASTICS PRODUCTION FACILITIES -- Moscow, Moskovskaya Pravda, 24 Apr 58

The only plant in the Chemical Industry Administration of the Moscow City Sovnarkhoz which specializes in the processing of plastics is the Moscow Karacharovskiy Plant. Therefore, attention should be given now to the creation of additional capacity at this enterprise. Plans have been made for modernization and replacement of obsolete equipment here, the

introduction of automatic lines, and the complex mechanization of the processing and packing of finished products. The processing of many articles will be converted to extrusion in two-level press-forms. A large part of production will be carried out by automatic presses. In addition to these steps, it is planned to put existing production areas to better use.

Despite a significant increase in capacity, the Karacharovskiy Plant will only partially be able to satisfy the needs of Moscow industry for plastic articles. To create additional capacity, the Chemical Industry Administration plans to utilize the available production space of two chemical plants (the Krasnopresnenskiy and Butyrskiy plants). This measure will permit an improvement in supplying the industry of the city with plastics.

A further increase in production will be made possible by the construction of new enterprises. In this connection, it would be expedient to build a large plant for the manufacture of polyethylene, polyvinyl chloride, and polyamide resins not far from Moscow. The city of Kryukov, the construction of which is planned, would be an ideal place for such an enterprise. -- Smirnov, Chief of the Chemical Industry Administration, Moscow City Sovnarkhoz

Rubber and Rubber Products

NEW USSR RUBBER VARIETIES -- Moscow, Byulleten' Tekhniko-Ekonomicheskoy Informatsii, No 3, 1958, pp 44-45

The All-Union Scientific Research Institute for Synthetic Rubbers has worked out a method for the production of new types of divinyl styrene rubbers (SKS-40D and SKS-50) and divinyl-alpha methylstyrene rubber. (SKMS-50).

The new rubbers are characterized by a higher content of linked stryene or alpha-methylstyrene than SKS-30, SKS-30A, and SKMS-30 rubbers. They are fabricated for use in the shoe industry and for the manufacture of various industrial rubber products.

Shoe sole material is made from SKS-40D rubber, which is lightweight and has a high resistance to wear. The rubbers SKS-50 and SKMS-50, with approximately the same properties, are employed in the production of storage tanks, acid and caustic resistant hoses, and several other articles.

The basic properties of the new varieties of rubber are as follows:

	SKS-40D	SKS-50	SKMS-50
Content of linked styrene or methylstyrene (%)	40	49	49
Tensile strength (kg/sq cm)	260	270	260
Specific elongation (%)	460	580	540
Residual elongation (%)	42	26	20
Elasticity in springing back to original form (%)	28	17	15

The production of rubber of the three new varieties is being conducted on equipment now available in synthetic rubber plants. The process of producing rubber SKS-40D, SKS-50, and SKMS-50 consists of the common polymerization in water emulsions of a mixture of divinyl with styrene and in the subsequent separating out of the rubber from the latex obtained as a result of the polymerization. A special feature of the process of producing rubber SKS-40D is the separate production of two latexes -- SKS-30 and SKS-90. The first of these is widely manufactured in USSR industry. Latex SKS-90 is obtained by a simultaneous polymerization in water emulsions of a mixture of divinyl with styrene in the proportion 10:90. Latexes SKS-30 and SKS-90 are mixed in the required quantities, after which the separation of the rubber from the latex occurs.

Preliminary data have shown that the cost of production of high styrene or methylstyrene rubbers is below the cost of the rubbers SKS-30 and SKMS-30, which contain no more than 26-27 percent styrene or methylstyrene.

The new rubbers widely extend the assortment of synthetic materials required for the various branches of industry.

Synthetic and Artificial Fibers

ADVANTAGES OF SYNTHETIC OVER NATURAL FIBERS -- Moscow, Izvestiya, 15 Apr 58

Synthetic fibers are many times more durable than wool and much stronger than steel.

[An abridged version of this article on varieties and quality of USSR synthetic fibers appears in the Daily Review of Soviet Press, Vol IV, No 89, Part II, 15 April 1958, pp 5-6]

Miscellaneous

ADVANCES AT FLUORSPAR COMBINE -- Tashkent, Pravda Vostoka, 26 Apr 58

We were recently at the Sredne-Chirchik Fluorspar Combine. A half year has passed since our last visit here, and what changes have taken place! During that time, construction of the second stage of the concentration factory has progressed considerably.

The flotation shop is finished. In the new part, which is three times as large as before, complex concrete foundations have been installed under the equipment, which is already in place.

The Sredne-Chirchik Fluorspar Combine overfulfilled the production plan for the first quarter 1958 in all technical-economic indexes. According to Artem Makarovich Pugachev, director of the combine, only a first-grade product will be put out by the enterprise. -- E. Torocheshnikova

(Article describes other construction now under way at the combine and in the workers' settlement nearby)

II. PETROLEUM AND GAS INDUSTRIES

USSR in General

USSR OBTAINS MORE OIL WITH LESS DRILLING THAN US -- Moscow, Pravda, 24 Mar 58

During the period 1946-1948, the USSR oil industry began to use inner and outer water flooding on a commercial scale.

The following table indicates the benefits which have accrued from the introduction of these methods to maintain pressure;

	Average Yearly Addition of New Wells on Stream	Average Yearly Increase (million tons)
1936-1940	1,450	1.2
1951-1955	2,290	6.6
1956-1957	2,072	13.6

In the last 5 years, the USSR increased its crude oil output 51 million tons, while the US increased its output 42.2 million tons. The US had to drill about 338 million meters of new wells in that period, whereas the USSR drilled only 27 million meters.

Pressure maintenance in the USSR has drastically reduced operating costs in extraction. Capital investments per increased ton of crude oil in the period 1955-1957 were 58.4 percent lower than in the period 1951-1953. In 1957, production costs per increased ton of crude oil were decreased by more than 40 percent below the 1951 level.

Some 7-8 billion rubles in capital investments has been saved already at the large and extensive Romashkino oil deposit in the Tatarskaya ASSR by dividing the deposit into sections and employing inner instead of outer water flooding as ordinarily used elsewhere.

The industry is not using hydraulic fracturing on a large scale because of the shortage of special aggregates.

With present methods, only 60-70 percent of the crude lying in the pools is extracted. The reason for this is that the known detergents which could be added to water are still costly.

In refining volume, the USSR has surpassed England, France, West Germany, and the Netherlands combined.

GASOLINE TRANSPORTED IN BRICK FORM -- Warsaw, Skrzydlata Polska, No 51-52, 17-24, Dec 57, p 18

It appears that the problem of transporting gasoline in tanks and barrels will be solved soon in the USSR.

The Institute of Fuels of the Academy of Sciences USSR has developed a method whereby gasoline can be transported in a solid state. Ordinary gasoline is mixed in special equipment with various substances. One of these is plastics. The mixture forms a thick mass, which is molded into brick forms, which are covered with a special membrane to prevent the gasoline from leaking out. One of these brick forms contains 95 percent pure gasoline.

The gasoline in the solid state can be transported in ordinary freight cars, airplanes, trucks, or other transport facilities without any fear of explosion.

When the material in solid state is transported to the designated place, the brick forms are liquified in special regenerator presses. In addition to being transformed from a solid to a liquid state in the large-capacity regenerators, the solid brick can be liquified in smaller units which could be mounted on motor vehicles, tractors, and even airplanes.

The brick-form gasoline is resistant to temperature, rain, and snow. It can even be stored under water for a long time.

EQUIPMENT SHORTAGE AFFECTS OIL INDUSTRY -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 23 Mar 58

During January-February 1958, the USSR extracted 17.2 million tons of petroleum and 4.4 billion cubic meters of gas. Petroleum production this year is scheduled to rise 14 percent above the 1957 level. The USSR is planning to increase its petroleum output to 350-400 million tons per year within the next 15 years.

As part of the long-range petroleum and gas program, the USSR plans to drill 7,283,000 meters of oil and gas wells in 1958, with 80 percent of this drilling to be done with the turbodrill.

The industry is suffering from many problems. The expected conversion to drilling smaller-width wells in 1958 must be delayed until 1959 because the Kungur Machine Building Plant does not plan to produce the smaller turbodrills and bits until the fourth quarter of 1958. The introduction of the more advantageous electrodrill on a wider scale is being delayed because this drill was previously underestimated by the

former Ministry of Petroleum Industry USSR and is underestimated even now. For example, Gosplan Ukrainian SSR reduced the quota by 20 motors this year for the Khar'kov Electromechanical Plant. Because of this, it is unlikely that the drill will be used in more than 2 percent of the drilling in 1958.

The extraction branch is scheduled to perform 2,845 hydraulic fracturing jobs in 1958 and requires 45 heavy-duty pumps, whose production has been held up by the Groznyy "Krasnyy Molot" and the Baku machine-building plants.

About 400 oil wells are shut down at the Romashkino deposit in the Tatarskaya ASSR, the largest in the USSR, because there are no grouped water pumping and filtering stations, reservoirs, mains, and other communications. Over 100,000 cubic meters of water was scheduled to be pumped daily in 1958 into the formations of the oil fields of the Tatarskaya ASSR to maintain pressure.

GAS RESERVES BY 1965 TO BE 3-4 TIMES PRESENT LEVEL -- Moscow, Stroitel'stvo Predpriyatiy Neftyanoy Promyshlennosti, No 1, Jan 58, pp 1-3

In 1955, the USSR extracted 9 billion cubic meters of gas. In 1957, extraction and production reached more than 20 billion cubic meters. In 1958, it is expected to reach nearly 31 billion cubic meters. Within the next 15 years, the USSR plans to increase its output by extraction and production to 270-320 billion cubic meters per year.

During recent years, gas deposits were discovered in various areas of the USSR. The deposits in Stavropol'skiy Kray are providing gas to Moscow through the Stavropol'-Moscow dual-trunk line. One line of this dual-line has already been laid, and the other parallel line is now under construction.

Within the next 2 years, a gas line is to be built from the Karadag deposit in Azerbaydzhan to the Armenian SSR and Georgian SSR.

The deposits in Krasnodarskiy Kray, whose reserves geologists estimate to be larger than those in Stavropol'skiy Kray, are to be another source of gas for Moscow and Leningrad since construction of a major trunk line is planned to these cities from the deposits.

A gas line is planned from the Stepnovo deposit near Saratov to Penza, Saransk, Gor'kiy, and Dzerzhinsk.

New deposits were also opened in Khar'kovskaya and Stalingradskaya oblasts, near Astrakhan', at Berezovo in Tyumenskaya Oblast, and in Kirgiziya.

In the next 6-7 years, approximately 30,000-35,000 kilometers of major gas lines are to be laid. This figure includes the offsets to cities. If this goal is accomplished, the important economic regions of the European SSR and of the Urals will be assured of gas.

In 1958, about 5,000 kilometers of pipe lines are to be laid, of which 3,000 kilometers are to be gas lines. The over-all volume of pipeline construction in 1958 will be 60 percent greater than the 3,500 kilometers laid in 1957. The pipelines will be laid through difficult terrain. More than 300 kilometers of the 800-kilometer gas line from Serpukhov to Leningrad passes through mud and forests. This line is to be finished no later than the third quarter of 1959. At the same time, the work on the second parallel line of the Stavropol'-Moscow line should be practically finished. In addition, a large number of compressor stations will be built along this line. For the first time in the history of compressor station construction in the USSR, the stations will be equipped with turbine compressors powered by gas turbines and electric motors. In the past, compressor stations were built after the lines were laid. In the future, the stations will be built at the same time the lines are laid and will be put in service simultaneously.

During the Fifth Five-Year Plan, 1.2 million meters of exploratory gas wells were drilled. The volume of exploration for gas is to be increased to 4 million meters in the Sixth Five-Year Plan and to at least 7-8 million meters in the Seventh Five-Year Plan. In 1958, the volume of exploration should increase at least 50 percent over the 1957 level. By 1965, gas reserves in the USSR should be to 3-4 times the present level.

NEARLY 35 PERCENT OF POPULATION TO USE GAS BY 1965 -- Moscow, Na Stroitel'stvo Truboprovodov, 5 Mar 58

In 1958, the output of gas extraction and production will reach more than 11 billion cubic meters and thus will triple the increase made through extraction in all of the preceding 5-year periods. In the near future, natural gas will account for 33 percent of the over-all increase in fuel resources.

Until lately, the search for gas alone was carried on only in those areas which were close to previously discovered gas deposits. In the other areas of the USSR, prospecting for gas was conducted simultaneously with prospecting for oil. In 1956 and 1957, the exploratory drilling goals were set separately for gas. This immediately provided favorable results because new gas deposits were opened in the eastern Ukraine, across the Volga River, northern Krasnodarskiy Kray, western and eastern Siberia, Bukhara-Khiva basin of Central Asia, and Azerbaydzhan.

In 1965, the over-all volume of prospecting for gas must increase to 2,340,000 meters from 575,000 meters in 1957.

The USSR now has nearly 10,000 kilometers of major gas lines. More than 30,000 kilometers of major gas lines are scheduled for construction during the period 1958-1965.

Prior to 1917, natural and petroleum gases were not used in Russia for domestic consumption. In 1913, only 2,700 apartments in Moscow were supplied gas from a plant in the city. In 1957, there were more than 520,000 apartments, about 900 dining establishments, 500 medical installations, and more than 200 educational institutions using gas. Gas is now used in 256,000 apartments, 3,100 municipal and cultural installations in Leningrad, 95,500 apartments in Kiev, and 72,000 apartments in L'vov. Gas is now used in nearly 100 percent of the apartments of Moscow, 90 percent each in Leningrad and L'vov, and 85 percent in Kiev.

With the construction of major gas lines toward the city, in 1960 Moscow is expected to obtain 4.5 times as much gas as in 1955.

According to preliminary estimates, approximately 500 cities and settlements should receive gas in the next 7-8 years. In 1965, approximately 35 percent of the USSR population will have gas.

The output of synthetic gas is to be increased in those areas which cannot be supplied with natural or petroleum gas. By 1965, the output of synthetic gas is to be increased to 5 billion cubic meters from 2 billion in 1957.

The use of pipe of 700 and 1,000 millimeters in diameter reduces capital investments and operating costs 37 percent and 63 percent, respectively. The USSR is endeavoring to produce thinner-gauge, higher-grade pipe of 800, 900, and 1,000 millimeters in diameter, but the pipe-producing plants are unable to produce the wider pipe with their present equipment and some are often idle because of late deliveries of sheet steel. Moreover, the pipe that is produced is heavy gauge. For example, the gauge of the 720-millimeter pipe is 9-10 millimeters and that of the 529-millimeter pipe is 8 millimeters. Furthermore, the welded and drawn pipe is out of round.

The Chelyabinsk Pipe Plant, which has the most modern equipment, has been producing pipe with an oval tolerance of plus or minus 3-4 millimeters, while other plants are able to reduce this tolerance to plus one or minus 1.5 millimeters. Some of the welded pipe produced by some of the plants contains cracks in the weld.

SHORTAGE OF PIPE AND OTHER EQUIPMENT HAMPERS GAS LINE CONSTRUCTION -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 7 Mar 58

By 1965, the USSR must lay about 30,000 kilometers of gas lines to keep pace with the expected increase in extraction and production of gas to 13-15 times the present levels within the next 10-15 years. More than 3,000 kilometers of these lines must be laid in 1958.

This large-scale construction program will depend entirely on the production of pipe, compressors, and other necessary equipment.

In 1958, the pipeline construction industry plans to use much more 720-millimeter pipe and to introduce 820-millimeter pipe into gas-line construction. This size pipe is obtained primarily from the Khartsysk Pipe Plant in Stalinskaya Oblast and the Chelyabinsk Pipe Plant. In 1957, both of these suppliers failed to meet the requirements of the gas industry on time because of late deliveries of sheet metal, and the failure posed serious problems in the construction of the second "link" of the dual Stavropol'-Moscow line and in the construction of the Shebelinka-Belgorod line.

Both of the above plants were unprepared to produce the wider pipe because of difficulties in obtaining materials from other plants. While production of the 820-millimeter pipe was eventually started in March 1958, production of the 720-millimeter pipe has been stopped.

The gas industry also has a difficult time obtaining 2,000-horsepower gas compressors for the compressor stations along the gas trunk lines. These units were to have been produced by the Gor'kiy Plant "Dvigatel' Revolyutsii," but in October 1957, two months after the plant produced its first sample, it found that it could not place orders for forgings for the crankshafts. As a result, the compressor stations being built in 1958 must be equipped with the smaller 10-GK-1 gas-powered compressors; twice as many must be used, and new and larger shops must be built.

Ukraine

DOLINA FIELD BECOMES UKRAINE'S LARGEST PRODUCER -- Kiev, Pravda Ukrainy, 11 Apr 58

The Dolina Oil Field, where oil was struck 7 1/2 years ago, has become the largest producer in the Ukraine. Its 44 wells are producing three times as much oil as the approximately 1,400 wells at Borislav. Moreover, the wells at Dolina are flowing, whereas those at Borislav are pumpers. The oil at Dolina is a high octane, paraffin base crude.

MORE OIL FOUND IN UKRAINE -- Kiev, Pravda Ukrainy, 2 Mar 58

Drillers have struck oil at a depth of 265-285 meters in the village of Brigadirovka near Belekley in Khar'kovskaya Oblast.

Another oil horizon was uncovered at Zachepilovka in Poltavskaya Oblast. A large oil and gas deposit has been discovered near Chernukhi, and oil pools were found at Kibinitsevskoye in Poltavskya Oblast and at Kachanovskoye in Sumskaya Oblast.

Central Asia

MORE THAN 60 PROMISING GAS STRUCTURES IN BUKHARA-KHIVA BASIN -- Tashkent, Pravda Vostoka, 19 Mar 58

Geological exploration in the Bukhara-Khiva basin indicates there are more than 60 promising gas structures in this area.

These structures are divided into eight groups. Two of them, Kagan and Khazhdin (Gazlik), have been explored already. Deep exploration has revealed large reserves of natural gas. The above two groups alone contain enough gas to start the construction of a major gas line in Uzbekistan.

The major gas line from Dzharkak to Tashkent by way of Bukhara and Samarkand, construction of which is now underway, will initially be fed gas from the Kagan group of deposits. It is expected that gas will be supplied to Bukhara and Kagan in 1958, to Samarkand and Katta-Kurgan in 1959, and to Tashkent, Chirchik, Begovat, and Yangi-era in 1960.

Gas will greatly change the fuel balance of Uzbekistan, which is now forced to haul in 25 percent of its coal.

Caucasus

REMOTE CONTROL OVER WELL OPERATIONS INTRODUCED IN GROZNYY AREA -- Moscow, Komsomol'skaya Pravda, 13 Apr 58

There are 400 wells operating by remote control in the Starogrozneft', Oktyabr'skneft', and Gorskneft' oil field administrations and the Pravoberezhnoye Oil Field in Checheno-Ingushskaya ASSR.

The wells are hooked up to the existing electric power and telephone lines.

24 STAVROPOL' WELLS SUPPLY GAS TO MOSCOW -- Moscow, Pravda, 25 Feb 58

Four more gas wells were put on stream at Stavropol' and connected to the gas main from Stavropol' to Moscow.

[Comment: For complete text, see The Current Digest of the Soviet Press Vol X, No 8, 2 April 1958, p 26]

Azerbaydzhan

INCREASE IN OIL OUTPUT DEPENDS GREATLY ON MAINTAINING PRESENT OUTPUT AT OLD SITES -- Baku, Bakinskiy Rabochiy, 29 Mar 58

The Azerbaydzhan oil industry is endeavoring to increase its yearly oil output to 20-22 million tons by 1965. This increase is expected to come primarily from the development of new sites and from maintaining the present level of extraction at the old sites. The decline in production at some of the old sites has been hampering the expansion of the republic's oil industry.

Efforts to maintain the present level of production in Leninskiy Rayon, where oil has been extracted for the past 88 years, is very important to the future operations of the Leninneft' Oil Field Administration. At present, more than 50 percent of the wells yield only up to one ton per day. Despite this, the ratio of crude supplied by Leninneft' is still significant.

Hence, attention to every well is quite important. In 1957, for example, 259 wells were subjected to hydraulic fracturing, and the process resulted in the output of 13,404 tons of crude oil. Forced extraction from water-filled formations produced another 4,000 tons. Still another 4,000 tons came from the acid-treatment of wells.

DRILLING MUST BE IMPROVED TO MEET GOALS SET BY INDUSTRY -- Baku, Bakinskiy Rabochiy, 30 Mar 58

New sites in Azerbaydzhan are supplying 11.6 percent of the crude oil and 67.3 percent of the gas. Exploration and development of these new sites has not only stabilized but also increased the extraction of crude oil and gas in the republic. For example, the discovery of the large gas-condensate depcsit at Karadag has contributed enormously to the expansion of the gas industry in Azerbaydzhan.

While the new discoveries have contributed to the rise in extraction of crude oil and gas, further increases in Azerbaydzhan require more deposits to be put on stream.

During the 7-year period 1959-1965, the volume of drilling must be increased to 1,554,000 meters per year. Nearly 33 percent of this must be exploratory. Commercial drilling speeds must be increased to 1,200 meters per machine-month in development and 410 meters per machine-month in exploration. In the future, drilling will be concentrated primarily at sites where the depths range from 5,000 to 7,000 meters and the geological conditions are complicated. The sites to be developed in the offshore areas are located where the depth of the sea ranges from 35 to 60 meters and more.

Considerable time that could be used for drilling is wasted on such auxiliary work as chemical processing and weighting the drilling solution -- work that adversely affects the technical and economic indexes. The drillers are frequently idle because of late deliveries of casing and weighting compound.

Drilling speeds can be increased with proper bits. It has been established that bits No 10 and No 11 can be best used in the conditions of Azerbaydzhan. The Azerbaydzhan oil industry still lags in the use of large block foundations upon which derricks are built, and this also has slowed down drilling. The present fixtures to regulate and control drilling no longer meet the new demands resulting from changes in depths and drilling conditions.

DIFFICULTIES WITH SUPPLY AND REPAIRS HAMPER INDUSTRY -- Baku, Bakinskiy Rabochiy, 6 Apr 58

In 1957, petroleum production in Azerbaydzhan reached the level originally planned for 1960.

In 1958, the over-all volume of gross production of the Ministry of Petroleum Industry Azerbaydzhan SSR is scheduled to rise 5.7 percent over the 1957 level. Petroleum extraction is supposed to increase by 448,000 tons and gas extraction 32.3 percent. The over-all goal for drilling is being increased by 154,000 meters. The industry plans to do 1.5 times as much exploration as in 1957. The goal in 1958 is to explore the deep Mesozoic formations in several areas.

Over-all labor productivity is scheduled to rise an average 5.3 percent, 7.3 percent in petroleum and gas extraction and 5.2 percent in petroleum and gas refining.

In the first quarter of 1958, the industry fulfilled its goals 100.3 percent for petroleum extraction and 103.8 percent for gas extraction. Average daily extraction of petroleum in the last 10 days of March was 550 tons higher than in the same period of January. Daily extraction of gas in the 3-month period increased by nearly one million cubic meters.

Nine of the 12 oil field administrations in Azerbaydzhan fulfilled their quarterly quotas. The Azizbekovneft', Buzovnyneft', and Siazanneft' oil field administrations failed to do so. The quarterly quota was not fulfilled by 22 of the 77 oil fields in the republic.

The quarterly goal was fulfilled 97.2 percent for over-all drilling and 88.7 percent for exploration.

Approximately only 50 percent of the existing wells work on a regime which was developed on the basis of research. The regime for the remaining wells is set up on the basis of the average measuring indexes of the last 3 months. The latter situation prevails particularly in the Azizbekovneft', Karadagneft', and Buzovnyneft' oil field administrations.

Many of the wells work only a short time between repairs. The number of repeated repairs is still high, and 37 percent of the repairs are performed with delays which are longer than the normal time set for repair jobs.

Hundreds of million of rubles are spent each year on current and capital well repairs. There is a great disparity between the number of wells that have been repaired and the number that have been returned to service after they have been repaired. For example, in 1957, only 293 of the 512 wells that were repaired in the Ordzhonikidzeneft' Oil Field Administration were put back into service. In the Stalinneft' Oil Field Administration, the number was 212 out of 310 wells.

Whether the Azerbaydzhan petroleum industry fulfills its 1958 quota depends to a great extent on the petroleum machine building plants. In the first quarter of 1958, many of these plants failed to provide new equipment, while others failed to provide the necessary spare parts to make capital repairs on the equipment on time.

III. FERROUS METALLURGY

General

NEW CONSTRUCTION REQUIRED TO FILL NEEDS OF SOUTHERN METALLURGICAL PLANTS -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 18 Apr 58

In 1959, ore requirements of ferrous metallurgical plants will increase, particularly in the southern part of the USSR where five oblast furnaces will be put in operation during 1958. To fulfill these requirements completely, extensive work must be done on the construction of large new mining and concentrating combines, new mines must be constructed, and existing mines and mining and concentrating combines must be expanded. However, the construction of mining and ore enterprises is proceeding at a slow rate.

For example, in the Krivoy Rog Basin, the 1958 first-quarter plan for construction was not fulfilled in mining enterprises. In projects under construction, manpower is inadequate and delivery of construction mechanisms and equipment lags. The capacities of auxiliary enterprises of the Krivbassstroy [Krivoy Rog Construction?] Combine are being exploited unsatisfactorily.

The Dnepropetrovskiy Sovnarkhoz did not provide adequate financing for the most important machinery or for the construction of the mining and concentrating combine.

With the organization of a special trust in the Krivoy Rog Basin, the Krivbassshakhtoprokhodka [Krivoy Rog Mine-Sinking?] Trust, the speed in sinking shafts has increased notably. However, the rate of performing mine operations and, in particular, the preparation of new levels, lags considerably behind fixed plans for introducing new facilities for ore extraction.

The supplying of iron ore to newly introduced and already-existing blast furnaces in southern metallurgical plants is complicated by the fact that at least 1.5 million tons of Krivoy Rog ore must be brought in every year to metallurgical plants in Lipetskaya and Tul'skaya oblasts. This can be avoided by speeding up the start of operations of mines in the Kursk Magnetic Anomaly and, in particular, in the Lebedinskoye and Mikhaylovskoye deposits. Possibilities exist for starting the first unit of the Mikhaylovskiy Mine in 1959, which would be one year earlier than the originally fixed date. The Kerch' Basin could become a large-scale source of ore for blast furnace shops of southern metallurgical plants.

The deposits of this basin contain enormous reserves of iron ore occurring in very favorable mining and geological conditions. However, because of the lack of proper attention to this basin, Kerch' ore is being used in very limited amounts and only in the Zhdanov Azovstal' Metallurgical Plant.

Technology

METHOD TO IMPROVE QUALITY AND DECREASE COST OF STEEL BEING INTRODUCED -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 25 Apr 58

Steel has always been poured into metal molds; during this process there were unavoidable defects in the ingots, such as shrinkage holes, friability, and heterogeneity in chemical composition and structure. The situation improved only after a radical change in the pouring of steel. Experiments and research in the Central Scientific Research Institute of Ferrous Metallurgy (TsNIIChermet) verified the possibility of the continuous pouring of steel.

In 1955, the "Krasnoye Sormovo" Plant imeni A. A. Zhdanov developed and constructed the first industrial installation on the basis of this research. It eliminates operations connected with pouring steel into molds and rolling bars for blooming mills, and this curtails the production cycle sharply, permits an improvement in the quality of the metal, and increases the yearly output.

Mechanization and automation of the process of receiving the bar during the continuous pouring of steel also improved work conditions.

The plant's open-hearth furnace shop has increased its output of steel 40 percent as a result of the introduction of new technology.

Slabs received from the installation were rolled to sheet for car building, machine building, and other branches of the national economy. The output of suitable slabs was 6.8 percent greater than that of usual ingots poured into molds.

The installation is profitable from the economic standpoint. This profit rose after a number of measures had been taken for improving the design of specific units, mechanizing processes, improving the technology itself, and reducing the specific norms for the consumption of various types of power.

As a result of taking these measures, the number of workers servicing the installation dropped from 96 to 70, and the number of engineers and technicians from 14 to 7.

In the fourth quarter of 1957, the productivity per worker at the installations was 79 tons, as against 68 tons per worker at the runner.

The number of types of steel poured by this method is increasing. In addition to the basic type "steel 3," low-alloyed steels of various types are poured by the method.

In 1957, the cost of processing one ton of metal in the installation was 13.88 rubles less than the cost of pouring it into molds. (In 1956 it had been 35.92 rubles more expensive.) In the first quarter of 1958, the cost of the new method dropped another 17.78 rubles.

CONFERENCE ON USE OF OXYGEN IN STEEL SMELTING OPENS -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 16 Apr 58

Yesterday, an all-union conference on the use of oxygen in the steel-smelting industry opened in Dnepropetrovsk. It was called by the Central Scientific Research Institute for Ferrous Metals, the Ukrainian Institute of Metals, the Dnepropetrovskiy Sovnarkhoz, and the Scientific Technical Society of Ferrous Metallurgy.

Associates of scientific research institutes, higher educational institutions, and workers of metallurgical plants are participating in the conference, which will continue for 4 days.

PROGRESSIVE BILLET MILL OPERATES IN NOVO-TULA PLANT -- Tallin, Sovetskaya Estoniya, 27 Apr 58

Metallurgists of the Novo-Tula Metallurgical Plant have been delivering rolled billets made by a new progressive method since December 1953. At first, the technology was carefully worked out for obtaining slabs with a cross section 150 x 480 millimeters. Later, the machine was reconstructed to produce square billets with a cross section 200 x 200 millimeters. Tens of thousands of tons of steel have already passed through the installation.

NEW METHOD OF DRILLING BOREHOLES -- Kiev, Pravda Ukrainy, 17 Apr 58

On the initiative of Kolosev, leader of a drilling brigade of the Bol'shevik Mine in the Krivoy Rog Basin, a new method of drilling boreholes, called a combination method, has begun to be used. This method is essentially as follows:

Usually drilling of horizontal and vertical boreholes is undertaken separately. The miner drills a horizontal borehole with a KS-50 hammer drill and a vertical borehole with a PT-45 telescopic drill. Kolosov combined these operations, drilling vertical and horizontal boreholes simultaneously, using two hammer drills.

Recently, Kolosov began operating simultaneously with three drills -- two KS-50, and one PT-45 -- and fulfilled his shift norm 380 percent.

The increase in labor productivity is because the innovator uses improved bits with four cutting edges, instead of one, for drilling boreholes.

NEW TECHNOLOGY DEVELOPED FOR EXTRACTING IRON FROM SIDERITE-BARYTIC ORE -- Kiev, Pravda Ukrainy, 6 Apr 58

A group of scientific associates of the Prague Scientific Research Mining Institute and the Krivoy Rog Scientific Research Institute for the Mechanical Concentration of Ferrous Metals "Mekhanobrchermet" has completed working out a new technology for extracting iron from siderite-barytic ore.

Such ore, available in large quantities in Czechoslovakia, contains copper in addition to iron. Barite is used for the preparation of whiting. Despite the use of the most perfected concentrating machines of American and West German firms, complete exploitation of these ores has not been achieved on a widespread scale.

The Krivoy Rog and Prague institutes have developed the only wet method for concentrating siderite-barytic ore. The "2VK-5" magnetic separators, designed by the Krivoy Rog Institute, are used for extracting iron. Tests, carried out by scientists on an industrial scale in one of the concentrating factories, indicated that the new method of extracting iron is much cheaper and more productive than previous ones.

ARGON-ARC METHOD USED IN PIPE WELDING -- Moscow, Vechernyaya Moskva, 19 Apr 58

Metallurgists of the Moscow Pipe Rolling Plant produce high-grade, thin-walled electric welded pipe for large tractors, dumpcarts, and transformers.

Great assistance is given to these metallurgists in their efforts to achieve technical progress and an increase in production by scientists of the Central Scientific Research Institute -- A. I. Tselikov, Corresponding

Member of the Academy of Sciences, and V. V. Nosal', Candidate of Technical Sciences. With the help of the scientists, workers of the enterprises mastered the production of thin-walled electric welded pipes of stainless steel. For this purpose the institute designed a special pipe electric-welding machine in which the welders, using the argon-arc method, have already prepared more than 350 tons of pipe for use by the paper, metallurgical, and chemical industries.

Recently, the scientists designed a new machine of a planetary (planetarnogo) type. It is intended for rolling pipe with walls 0.2-0.5 millimeter thick. One such aggregate replaces eight pipe-rolling mills of the usual type.

PIPE PLANT MASTERS NEW PIPE-MAKING TECHNOLOGY -- Leningradskaya Pravda, 25 Apr 58

A new shop was recently put in operation in the Sinarsk Pipe Plant. All the shops in the plant make pipe, but the methods for preparing them are completely different.

In the pipe-casting shop which has been in existence for many years, pipe is made from cast iron with the aid of large aggregates: circular, rotating machines. In the rolling and drawing shops, pipes are made with the help of rolling and drawing for which various bulky equipment is required. With these methods the pipes require electric welding. In the new shop, pipes are made from a steel strip, the seam of which is then welded with copper.

The technology of a recently mastered method of preparing pipe is very interesting. A special installation feeds the steel strip to the chemical and electrochemical baths for degreasing and then to the pickling bath. In the last two baths for cyanogen copper plating, it is covered with a layer of copper up to 5 microns thick. From here the copper-plated strip, from 300 to 600 meters long, goes to a second bay, the main bay of the shop. Here it is subjected to other operations and is conveyed to a 14-stand molding (forming) machine. Powerful rollers roll the strip to a two-layer pipe. The next mechanism cuts off one pipe after another of the required measurements, a recorder counts off 30 of them, and the entire parcel is sent to a muffle furnace where soldering takes place. Cooling, calibration, trimming, and packing follow.

ESTIMATED PRODUCTION OF INSTALLATIONS OF "KAZAKHSTAN MAGNITKA" -- Alma-Ata, Kazakhstanskaya Pravda, 8 Apr 58

The Karaganda Metallurgical Combine, one of the largest in the USSR, is being constructed near Temir-Tau. The people call this future metallurgical giant the "Kazakhstan Magnitka."

The useful volume of its first blast furnace, construction of which has already started, will amount to 1,513 cubic meters; that of subsequent ones 1,700-2,000 cubic meters, much more than the volume of blast furnaces of the Ural Magnitka. Every 24 hours, such a blast furnace will process 9,000 tons of charge materials: ore, coke, flux. Every 4 hours the furnace will deliver a melt of more than 400 tons of pig iron. Two furnaces, which will be put in operation at the end of the Sixth Five-Year Plan, will deliver 1,356,000 tons of pig iron per year.

Because of the close location of the raw materials, the high degree of mechanization, and automation of labor-consuming processes, the Karaganda Metallurgical Plant will supply the country with its cheapest metal.

Production of the plant will be varied, starting with hot-rolled and cold-rolled sheet, tin plate, and untinned iron plate and ending with curved profiles of sheet metal.

In the make-up of the Kazakhstan Magnitka, there will be a coking shop which, in complexity and volume of output, will be an independent plant. A heat and power station, repair shops, and auxiliary shops are also planned for the combine.

All enterprises of the Kazakhstan Magnitka will be constructed with the benefit of the most modern achievements of Soviet and foreign techniques. This will assure high labor productivity. For example, smelting of pig iron per worker in the blast furnace shop will amount to 11,340 tons per year, whereas it does not exceed 7,000 tons in the most outstanding US plants.

The automatized continuous sheet mill "1700" will roll sheet 1.2 millimeters thick at a speed of 15 meters per second.

UNITS OF KAZAKHSTAN MAGNITKA TO START OPERATING IN 1958 -- Alma Ata, Kazakhstanskaya Pravda, 27 Apr 58

In 1958, the first productional units of the Kazakhstan Magnitka will be put in operation. These are the machine shop, a turbogenerator with 25,000-kilowatt capacity, and two boilers of the plant thermal electric power station. The first blast furnace, two cokes batteries, the first unit of the Toparskiy Limestone Quarry, the foundry, and other parts of the plant will be put in operation in 1959.

The volume of capital investment is enormous: 340 million rubles has been released for construction-assembly work. There will be a considerable increase in capital investment in 1959 and, in 1960, tremendous sums will be expended. The socialist industry of Kazakhstan has never known construction work on such a scale.

KMA ORE COMBINE INCREASES OUTPUT -- Moscow, Sovetskaya Rossiya, 13 Apr 58

Competition to meet 1 May honorably is spreading daily in the Gubkin KMAruda Kursk Magnetic Anomaly Ore Combine. In the past month, workers of the concentrating factory delivered above the plan about 1,000 tons of prepared raw materials. In April, workers of the agglomerating shop are multiplying their successes.

Recently, a shop was created here for flotation of oxidized iron, which had previously been rejected in large amounts together with waste rock. As a result, losses in raw materials were decreased to a minimum and output of concentrate was increased 10-15 percent.

MOSCOW PLANT HAS LARGE STEEL OUTPUT -- Moscow, Moskovskaya Pravda, 12 Apr 58

Many industrial enterprises of the USSR and the People's Democracies are receiving high-grade alloyed steel from the Moscow Plant "Serp i Molot." Workers of the plant are continually striving to increase the output of metal. In March alone, they produced hundreds of tons of steel above their established quotas. This was the result of the persistent effort of the workers to introduce new techniques, improve technology, and consolidate the working day.

TAGANROG PLANT STILL NEEDS TO STEP UP METAL-SAVING PROGRAM -- Moscow, Sovetskaya Rossiya, 26 Apr 58

The output of steel is being increased from year to year in the Taganrog Metallurgical Plant. Workers, engineers, and technicians are exploiting internal possibilities for increasing labor productivity.

The most important reserve for raising the production output is reducing flaws and curtailment of consumption of metal. As against 1957, the flaws in casting have been reduced almost one third. Thousands of additional tons of steel have been produced as a result of this.

The workers of the first pipe-welding shop demonstrated the importance of saving metal. In 1957, the shop not only fulfilled the plan but, as a result of saving, delivered 1,376 tons of pipe above their quota. During 2 months of 1958, they saved 215 tons of metal.

Rolling-mill workers have somewhat improved their work. In the first quarter of 1958, they saved more than 800 tons of ship and boiler steel but they are continuing to use an excessive amount of three-layer steel. They have not learned to strive to save every gram of metal. In 2 months only, losses have exceeded 140 tons.

UZBEK STEEL WORKERS SMELT BY HIGH-SPEED METHODS -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 20 Apr 58

Steel workers of the Uzbek Metallurgical Plant imeni V. I. Lenin have considerably exceeded the obligations which they had assumed in honor of 1 May. Hundreds of tons of steel in addition to their assignment have been smelted by them since the beginning of April. Smelting has been done by high-speed methods since the first part of April. Three of the workers were able to shorten the time required for one melt by one hour. The average acceleration figure for workers of the open-hearth shop was 35 minutes.

NEW RAW MATERIALS FOR KUZNETSK PLANT -- Riga, Sovetskaya Latviya, 27 Apr 58

Two mines, the Kazskiy Mine and the Teyskiy Mine are being constructed to exploit the iron ore of Gornaya Shoriya. When these two mines are put in operation, the Kuznetsk Metallurgical Plant will be completely assured of local raw material.

MINERAL WEALTH OF KUSTANAY ECONOMIC REGION -- Yerevan, Kommunist, 12 Apr 58

The reserves of magnetite ore in deposits near Kustanay exceed 10 billion tons and have an iron content ranging from 45 to 62 percent. The mining and concentrating combine, which is under construction here, has a capacity of up to 25 million tons of ore per year and is already directing its production to the Chelyabinsk Metallurgical Plant.

The ferrophosphorus ores concentrated in the Kustanay economic region present great practical interest. These deposits can be exploited by the open-pit method. Phosphorus slag, a valuable mineral fertilizer for agriculture, is obtained as a by-product in processing phosphorus limonite. The construction of the Lisokovskiy Mining and Concentrating Combine has been started here and the combine is expected to extract 21 million tons of ore per year.

GEOLOGISTS REPORT LARGE USSR IRON ORE DEPOSITS -- Moscow, Sovetskaya Rossiya, 15 Apr 58

In recent years, geologists have discovered in Belgorodskaya Oblast several new deposits of high-grade iron ore. Here the magnificent outlines of the new gigantic basin with great ore reserves are becoming more and more visible.

The rich ore deposits are northeast of Belgorod in the neighborhood of the village of Khokhlovo. The Gostishchevo deposit was discovered near Yakovlev. Its total deposits are estimated to be several times as great as those of the Krivoy Rog Basin, the largest in the USSR.

In the Khokhlovo section, the reserves are estimated at up to one billion tons. About 17 percent of these belong to the high-grade ore group. It is not necessary to concentrate them because they contain very little harmful admixtures. The average depth of this ore is 400 meters. The thickness of the deposit is 70-250 meters, and in places, 275 meters. The first boreholes have indicated that the width of the ore body reaches 600 meters. However, final boundaries for it have not yet been established.

Miscellaneous

USSR PLANTS PRODUCE NEW, LIGHT, DURABLE STEEL FOR PETROLEUM INDUSTRY -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 23 Apr 58

For 3 years, the Stalingrad Petroleum Refining Equipment Plant imeni Petrov has been preparing for the petroleum industry apparatus made of highly durable, low-alloyed steel of the new types M and 3N. The weight

of the items issued and the labor required to produce them have been reduced considerably. In 1957 alone, the plant requirements for metal were decreased by 860 tons. At the same time the consumption of finishing metal, flux, and electric power was curtailed. More than one million rubles was saved as a result of this.

At present, a number of enterprises issue apparatus made from M and 3N steels, in particular the Podol'sk Plant imeni Ordzhonikidze and the Taganrog Krasnyy Kotel'shchik Plant. The Penza Chemical Machine Building Plant has made four vessels from these steels and they weigh 15 tons less than vessels made of other types of steel. Here it has been estimated that the issuing of heavy-walled vessels made of the new steels, planned for 1958, can lead to a saving of more than 300 tons of metal.

M and 3N steels were developed by the Stalingrad Affiliate of Giproneftemash (State Institute for Designing Petroleum Machinery). They are easily smelted and are characterized by high durability. No special technology is required for processing them. The cost of type 3N steel is about equal to the cost of low-alloyed steel of type 3. M type steel is 5-10 percent more expensive.

Up to now, steels of these types have been produced only in the Zhdanov Plant imeni Il'ich and not in any other ferrous metallurgical enterprises.

IV. NONFERROUS METALLURGY

General

LARGE-SCALE EXPANSION PLANNED FOR NONFERROUS METALLURGY -- Moscow, Tsvetnyye Metally, No 5, May 58, p 2

The USSR plan for 1959-1965 provides for the construction of many enterprises in all leading branches of industry. In the nonferrous metallurgical industry, the construction of mines, concentrating factories, plants, and combines will be completed in many areas of the country.

In view of the increase in their raw material base and successes in exploratory work, many operating mining and concentrating enterprises of the nonferrous metal industry should be expanded, including the Leninogorsk, Zyryanovsk, Achisay, Tyrny-Auz, Kadzharan, Severoural'sk, and Sorsk combines. The capacities of the Balkhash, Ust'-Kamenogorsk, Chimkent, Orsk, Monchegorsk, and other plants will be increased. Exploitation operations will be started in the large copper and lead-zinc polymetallic deposits of Kazakhstan, the North Caucasus, and the southern Urals. New alumina and aluminum plants in the east will take a leading part in the creation of considerable new facilities for the production of aluminum.

For the first time, alumina will be produced on a broad scale in one of the plants, based on utilization of complex syenites (nephelines) which have a relatively low aluminum content.

Large diamond-mining enterprises will be constructed in the Yakutskaya ASSR. Gold mining by the dredging method will be extended. Construction for the rare metal industry and enterprises for processing nonferrous metals are also being planned.

Development of mining enterprises will be achieved by a further increase in the amount of open-pit mining and highly productive systems of working deposits. By 1965, it is planned to increase the proportion of open-pit mining in the copper industry from 55 percent to 86 percent, in the lead-zinc industry from 21 percent to 35 percent, and in the tungsten-molybdenum industry from 30 percent to 40-45 percent. The proportion of open-pit mining will also be increasedin the nickel industry, where it already amounts to 70 percent of the operations.

During 1959-1965, a considerable increase in the production of nonferrous metals will be assured by intensification of production processes and modernization of installed equipment. This tendency in the development of industry provides for improvement in the exploitation of raw

materials and equipment, an increase in the specific productivity of aggregates as a result of introduction of technical improvements and better organization of production, elimination of bottlenecks, and replacement of operating apparatus by more productive ones.

During 1958-1965, the task set by the 20th Congress of the CPSU should be worked out in the main -- the transition from automation of individual aggregates and operations to the all-round automation of technological processes and the creation of completely automatized shops and enterprises. Much preparatory work has already been done toward fulfillment of the indicated tasks; systems and instruments have been developed and, in part, introduced for automatizing the operations of specific machines and installations, for the automatic regulation of the most important technological phases of such industrial processes as mining, concentrating, and metallurgical processing of ores.

Automation of operations of reverbatory furnaces in the copper-smelting industry increased their specific productivity 8-11 percent, lowered the specific consumption of fuel 6-9 percent, and lengthened the between-repair run of the furnace. In the Solikamsk Magnesium Plant, automation in regulating operating conditions of the electric furnace in the second stage of dehydrating carnallite increased the productivity of the furnace 14 percent; automation of crushing operations in concentrating factories increased their productivity, improved the quality of the crushing, and at the same time, reduced the number of servicing personnel.

NONFERROUS METALS IN CHITINSKIY SOVNARKHOZ -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 6 Apr 58

A sharp increase in the extraction of nonferrous metals is possible in the Chitinskiy Sovnarkhoz. To this end, it is necessary to raise the level of the metallurgical industry to that of available natural resources. Construction of new mines and factories will permit an increase in the production of lead to three times the former level and molybdenum to seven times the former level. At the same time, the production of zinc, tin, and tungsten will be doubled. It is important to create conditions for the increase of the proportion of open-pit mining from 16 to 55 percent since this will make it possible to decrease production costs of ore and, consequently, of nonferrous metals.

Solution of the task of converting nonferrous metal enterprises from unprofitable to profitable categories rests on efficient operation. To this end, the problem of extracting rare and scattered elements must be solved. Up to now, nonferrous metals have been produced in metallurgical

plants of the Urals from concentrates issued by enterprises of the Chitinskaya Oblast. To eliminate this inefficient transport, a lead-zinc metallurgical plant should be constructed in the neighborhood of Nerchinsk. Such a plant would be able to supply finished production for the national economy.

Technology

INSTITUTE CREATES NEW METAL CERAMIC ALLOY -- Leningradskaya Pravda, 26 Apr 58

A new metal ceramic alloy has been created in the Institute of Metal-Ceramics and Special Alloys of the Academy of Sciences Ukrainian SSR from a mixture of powders of carbide, chrome, and nickel. It weighs half as much, is far cheaper, and is almost as hard as carbide-tungsten alloy; and it is three to four times as resistant to hydrochloric and nitric acids.

The new alloy is also resistant to alkalies, solutions of various salts, sea water, petroleum products, and several molten metals. It does not become oxidized after long exposure to the activity of high temperatures.

HIGH-SPEED BRIGADE ACHIEVES RECORD IN DEVELOPMENT WORK -- Alma-Ata, Kazakhstanskaya Pravda, 15 Apr 58

At the end of 1957, new ore deposits with a rich content of lead were explored a few kilometers from the workings of the Achisay Mine. The problem was to reach the ore zone as quickly as possible. To solve this, a high-speed brigade led by Engineer Fred was organized in mid-January 1958. During 15 days of January, this brigade cut 104 linear meters. During February, the brigade upset all previously planned estimates and cut 228 linear meters; the figure for March was 253 linear meters. Such speed was previously unknown at any mine in Kazakhstan. Engineer Fred's brigade has resolved to raise its performance to 300 linear meters during April as its contribution to the 1 May competition.

FIRST RESULTS IN USE OF DOMESTIC DIAMONDS FOR DRILLING EXPLORATORY BOREHOLES -- Moscow, Razvedka i Okhrana Nedr, No 4, Apr 58, pp 19-21

The year 1957 marked the successful use of domestic diamonds for drilling exploratory boreholes. Diamonds proved to have high-grade drilling qualities.

Before the discovery of diamonds in the Yakutskaya ASSR, exploratory wells in hard and very hard rock were drilled by shot drilling, which is less productive than diamond drilling, and to assure proper yield of the core, bits with large diameters must be used. An increase in the diameter of the borehole leads to the overloading of the entire equipment and the drilling machinery and, finally, increases the cost of operations. For this reason exploratory borehole specialists have always striven to replace shot by diamonds. However, the high cost of imported diamonds has been an obstacle to this.

With the discovery of domestic deposits of diamonds, the technique of exploratory drilling is changing substantially. Thorough research was conducted on the drilling qualities of domestic diamonds with studies both in the laboratory and under field conditions. To compare the quality of Yakut and foreign diamonds, experimental drilling was carried on with small-diamond bits of the same type, prepared in the plant from domestic and foreign diamonds, with the diameter of the bits 46 and 59 millimeters. Field operations were carried out in the Kopanskaya geological-exploratory group in the Urals and in the Shalgiinskaya geological-exploratory group in Kazakhstan. Unfortunately, the experimental boreholes did not encounter rock with a high degree of resistance to drilling. The diamond bits cut mostly into rock of categories IX and X.

The drilling was carried out with ZIF-300 machines under the following system:

1. End pressure 500, 700, 900, 1,000, and in part, 1,300 kilograms.

2. Number of revolutions of the bits per minute 102, 165, 220, 420.

3. Amount of industrial liquid 15, 30, 40, and 70 liters per minute.

A total of 1,863.4 meters was drilled, including 1,058.5 meters by domestic diamonds and 804.9 meters by imported diamonds.

Analysis of the results obtained indicated that, in the case of the indicated rock, the mechanical speed of drilling was 1.11 meters per hour for domestic diamond bits and 1.03 meters per hour for foreign diamond bits. This indicates that drilling speed with domestic diamond bits is somewhat greater than with foreign diamond bits.

In the first stage of drilling, particular attention was paid to end pressure and the number of revolutions of the bit. An increase of 40 percent in end pressure from 500 to 700 kilograms results in a rise in mechanical speed of 11.5 percent in rock of category IX and of 28.5 percent in rock of category X. Correspondingly, with an increase in end

pressure of 80 percent from 500 to 900 kilograms, the increase in mechanical speed will be 42 and 55 percent, respectively. In all cases the increase in mechanical speed lags behind that of end pressure.

A 33.5-percent increase in the rotation of the bit, from 165 to 200 revolutions per minute, assures an increase in mechanical speed of 22.5 percent for category IX and 31.5 percent for category X. With the increase of the speed of rotation by 154 percent, from 165 to 420 revolutions per minute, the mechanical speed increases correspondingly by 113 and 174 percent, respectively. Consequently, mechanical speed depends to a greater degree on the number of revolutions of the bit than on the end pressure.

At the same time, geological exploratory groups made a comparison between the productivity of diamond drilling and iron and steel shot drilling. This indicated that for the given type of rock, the productivity of diamond drilling was 95 percent higher than that of iron shot and 65 percent higher than that of steel shot drilling. The consumption of diamonds in drilling rocks of categories IX and X was 0.23 carat per linear meter. A close economic calculation has indicated that the cost of drilling one linear meter is 131.98 rubles for diamonds and 175.19 rubles for shot.

Such are the preliminary results of experiments with domestic diamonds. Operations started in 1958 in the Yuzhno-Dashkesan geological-exploratory group have shown that rock of the XI and XII categories of resistance to drilling is being successfully drilled with domestic diamonds.

Combines, Plants, Deposits

NONFERROUS METALS COMBINE ACHIEVES SUCCESS -- Tashkent, Pravda Vostoka, 13 Apr 58

Workers of the Altyn-Topkan Combine were successful in the competition of enterprises of the Tashkentskiy Sovnarkhoz and were awarded the Transferable Red Banner of the Council of Ministers Uzbek SSR and the Uzbek Council of Trade Unions and a first prize in cash.

Workers of the combine are increasing labor productivity daily and raising their output of production. The gross plan for March was fulfilled 106 percent, the plan for extracting lead ore 108.9 percent, and the plan for production of lead concentrates 105 percent and copper concentrates 130.7 percent.

Workers of the concentrating factory and the Kurgashinkan Mine did a particularly good job. The miners exceeded the plan for metal content of ore by 11.4 percent.

POLYMETALLIC COMBINE GIVES GOOD PERFORMANCE -- Alma-Ata, Kazakhstanskaya Pravda, 26 Apr 58

Miners and workers in the concentrating factory and metallurgists of the Leninogorsk Polymetallic Combine have achieved high production indexes in the period prior to 1 May. Workers of the Bystrushinskiy Mine did particularly successful work. Since the beginning of April, they have brought above ground about 3,000 tons of above-plan ore.

METALLURGISTS OF URALS AND KAZAKHSTAN JOIN IN FRIENDLY COMPETITION -- Alma-Ata, Kazakhstanskaya Pravda, 26 Apr 58

Metallurgists of the Aktyubinsk Ferroalloys Plant are joined in a bond of close professional friendship with workers of the Chelyabinsk Order of Lenin Ferroalloys Plant. Competition and wide exchange of experiences between the metallurgists of the Urals and Kazakhstan are helping them to move forward more successfully and to increase their output of metal. At present, the Kazakhstan ferroalloy workers hold the first place in socialist competition of all enterprises of the Aktyubinsk Economic Region.

NEW AUTOMATED ALUMINUM PLANT TO CUT DOWN ON PERSONNEL -- Leningradskaya Pravda, 27 Apr 58

A very large aluminum plant is being constructed near Pavlodar according to a plan of Leningrad specialists. However, there will be fewer workers in this plant than in a comparatively small enterprise of the same type because of the widespread introduction of various automatic devices. Automation of only complicated and large-scale production will be undertaken at first and this will lead to reduction of the number of required servicing personnel by hundreds.

NEW NONFERROUS METALS DEPOSIT TO BE WORKED IN 1958 -- Leningradskaya Pravda, 12 Apr 58

A report from Ust'-Kamenogorsk states that miners of the Glubochanskoye Mine-Construction Administration cut through a main mine working far underground and discovered a new ore deposit with a rich content of nonferrous metals. Extraction of the ore here will be started during 1958.

NEW MINERAL DISCOVERED IN SAMARKANDSKAYA OBLAST -- Kiev, Pravda Ukrainy, 6 Apr 58

A new thallium mineral, unknown up to now, has been discovered in the Zirabulak mountains in Samarkandskaya Oblast. The great scientist of the past, Abu-Ali Ibi-Sina, known by the name of Avitsenn, lived and did his creative work in this region and so the mineral has been called "avitsennit" in his honor.

A special analysis has shown that avitsennit contains thallium primarily and, in considerably smaller quantities, iron, antimony, and a number of other elements. A study of the new mineral is being continued.

Miscellaneous

ROLLED STOCK FROM NONFERROUS METALS AND ALLOYS ON INCREASE -- Moscow, Promyshlenno-Ekonomicheskaya Gazeta, 16 Apr 58

In conformance with the growing requirements of the national economy, a rapid increase is in progress in the production of rolled stock from heavy nonferrous metals and alloys, including brass, tombac, German silver, and various bronzes.

This rolled stock becomes an integral part of many machines, aggregates, apparatuses, instruments, and devices. It finds widespread use in the motor vehicle, aviation, electronics, transport, and shipbuilding industries, as well as in the preparation of widely consumed commodities.

Workers of the nonferrous metallurgical industry have mastered many new types of alloys having high plastic properties, good anticorrosive durability, and high resistance to heat. This has been achieved as a result of the improvement of techniques and the introduction of new machines and technological processes.

Three-phase and three-channel induction furnaces with a capacity of more than one ton, high-frequency vacuum furnaces, and semicontinuous casting has begun to be widely employed in plants for the processing of nonferrous metals.

Recently, the weight of the ingot being rolled increased to 1.5-3.0 times what it had previously been. The speed for cold rolling metal rose considerably. Reduction during rolling increased because of the installation of more powerful and improved rolling mills.

In the Krivoy Rog Plant for Processing Nonferrous Metals a three-stand continuous rolling mill has been installed for the first time in this branch of industry and it is operating successfully, permitting a sharp increase in the output of billets for the rolling of brass strips. The four-high rolling mill 250 is being automatized here. Continuous control of the pressure of the metal in the rollers is established here during the rolling process, as well as automatic regulation of the thickness of the strip during the rolling process and prompt stop of the mill at the end of each pass. A calculation of the coils is also made in winding and unwinding the rolls on reels. All this permits a sharp decrease in waste, lowers the amount of rejects, assures the output of rolled stock with a minimum of permissible variations and will result in a saving of 500,000 rubles per year.

V. COAL INDUSTRY

General

CONVERSION TO 6-HOUR DAY CONTINUES -- Kiev, Pravda Ukrainy, 22 Apr 58

The miners of the Kizel and Vorkuta basins and Magadanskaya Oblast are to convert to the 6-hour day during the period May-August 1958; those of the Kuznetsk and Karaganda basins, the Intaugol' Combine and Arktikugol' Trust during the period June-September 1958; and the Moscow, Sakhalin, Primorskiy, Central Asia, and other basins and regions during the period August-December 1958. The surface operations in Donets and L'vov-Volyn basin mines will change during the May-August 1958 period.

Administration

NEW RESEARCH INSTITUTE ESTABLISHED IN KARAGANDA -- Moscow, Pravda, 8 Apr 58

The Giprouglegormash Institute [State Planning Institute for Coal Mining Machine Enterprises?] has been organized in Karaganda. The scientific research, planning, and construction establishment will be responsible for planning the construction of mines, pits, surface buildings, and installations and for the construction of mine machines and mechanisms.

Production

UKRAINE PRODUCTION EXCEEDS 1957 -- Kiev, Pravda Ukrainy, 17 Apr 58

Coal production for the Ukrainian SSR for the first quarter of 1958 amounts to 40,297,000 tons, 10 percent higher than production for the same period of 1957.

COSTS GIVEN -- Moscow, Planovoye Khozyaystvo, No 4, Apr 58, p 90

In 1957, 222,000 tons of coal was extracted from the Kimovskiy open pit at a cost of 20.76 rubles per ton. This cost is 37 percent of the average per-ton cost for the Tul'skiy Sovnarkhoz. Actual labor productivity was 192.9 tons a month, four times the average for the Tulaugol' Combine.

Construction and Investment

CONSTRUCTION TO BEGIN AT KUZBASSUGOL' COMBINE -- Moscow, Trud, 9 Apr 58

Measures are being taken to begin construction work at the Kuzbassugol' Combine. A total of 22.5 million rubles will be spent in 1958. To be completed are an administration and social building, two mine-cage shafts, buildings for a concentration plant, a machine shop, and boiler shop.

NEW MINE CONSTRUCTION -- Kiev, Pravda Ukrainy, 12 Apr 58

Mine No 38 Komsomol'skaya is under construction in the Donbass. Already built are a mine surface building and machine shop. The young Komsomol mine builders have sunk 330 meters of the main shaft and almost 350 meters of the auxiliary shaft. In the near future, they expect to begin opening the coal seams and cutting the drifts and faces.

Prospecting

USSR COAL BASINS -- Ugol'naya Promyshlennost' SSSR v Shestoy Pyatiletke (The USSR Coal Industry in the Sixth Five-Year Plan), Moscow, Ugletekhizdat, 1956 (book by D. T. Onika), pp 41-56

In 1955, more than 70 percent of the coal was extracted from flat-dipping seams, 12 percent from inclined seams, and 17.2 percent from steeply dipping seams in the Donbass.

Almost 70 percent of Donbass reserves are in seams having a thickness up to one meter. The average thickness of an exploitable seam is 0.89 meter, while 55 percent of all the coal is extracted from seams up to one meter thick. The depth of mining fluctuates from 100 to 1,000 meters in 40 percent of the mines, coal is extracted at a depth of more than 300 meters. Of all the mines, 74 percent are gaseous and 54 percent are hazardous because of coal dust. The majority of the seams being worked are in danger of sudden ejections of coal or gas.

The Donbass is the largest USSR producer of high-quality coking coal. Approximately 60 percent of all the metallurgical coke in the USSR is supplied by this basin. Surveying carried out during the postwar years in the area of Dnepropetrovskaya Oblast has revealed from 5 to 12 flat-dipping seams with a thickness of from 0.6 to 1.8 meters, each covered by a stratum of porous rock 60-200 meters thick. The coal is gas-caking and has a low ash and sulfur content.

More than half of the total deposits of the Moscow Brown Coal Basin are in Moskovskaya and Tul'skaya oblasts; the rest are in Kaluzhskaya, Ryazanskaya, and Smolenskaya oblasts.

The seams of the Mosbass do not lie at a very great depth. Part of those being exploited have a thickness of over 0.9 meter and the ash content of the coal varies up to 45 percent. Almost 90 percent of the coal is extracted from seams having a thickness of from one to 3.5 meters. However, the average thickness of exploitable seams varies from 2.1 to 2.3 meters. The seams are horizontal, undulating, and complicated by karst disturbances. Construction and exploitation in Mosbass mines are carried out in difficult hydrogeological conditions which necessitate drainage of mining areas during development work.

Despite its high ash and moisture content, Mosbass coal is a good power-generating fuel and highly effective when used in pulverized form by the various large electric power stations, such as Stalinogorskaya, Shchekinskaya, and Cherepetskaya. The main consumers of Moscow coal are electric power stations and railroads. In a mixture with Donbass coal, it is more economical for use in steam locomotives than Donbass coal used alone.

The Dnepr Basin extends along the right bank of the Dnepr River from Zaporozh' to Zhitomir. Its seams do not lie very deep; they vary from 3-5 meters to a maximum of 26 meters in thickness.

The coal is brown, earthy, with a high moisture content. Its mean calorific value is about 2,000 kilocalories per kilogram on a working-fuel basis. The middle group of coal seams has a lower ash content, while the ash content in general fluctuates from 11 to 40 percent or more. The coal is mined chiefly by the open-pit method and is used mainly in electric power stations.

Coal output in the basin is expected to rise approximately 40 percent during the Sixth Five-Year Plan.

The Pechora Basin has enormous deposits of coal, of which the greater portion are coking-quality. More than 65 percent of the surveyed reserves are in the Vorkuta and Inta deposits.

All existing mines are gaseous. Most of the seams are inclined; almost 70 percent of the coal is extracted from steeply dipping seams. Coal is extracted from seams having a thickness of from 0.5 to 4.5 meters. The average thickness of workable seams is 1.47 meters.

During the Sixth Five-Year Plan, coal output in the basin will rise 34.2 percent.

The demand for Ural coal, particularly coking coal, greatly exceeds the supply, even though the development of the coal industry in the basin has been great. A considerable amount of coal is imported from the Kuznetsk and Karaganda basins. Ural coal basins include the Kizel and Chelyabinsk basins, as well as Sverdlovskaya Oblast coal.

The Kizel basin in Molotovskaya Oblast has seams which vary in coal content and are comparatively small. Seam thickness varies from 0.5 to 4.5 meters; almost 80 percent of the coal comes from seams over one meter thick. The depth of development in various mines of the basin varies from 700 to 800 meters.

The basin has complex geological conditions, such as partially broken and eroded seams which lie in great folds varying from a steep dip to flat. Twenty-seven percent of the coal is extracted from almost flat seams, approximately 35 percent from inclined seams, and 38 percent from steeply inclined seams. Almost 30 percent of the seams are gaseous.

Kizel coals are gas and fat-caking. Their calorific value is 5,400 kilocalories per kilogram on a working-fuel basis. Because of its high sulfur content the coal is used primarily as a power-generating fuel, and only a small amount is used in ferrous metallurgy and for coking.

The coal seams of the Chelyabinsk basin are complex in structure and vary in thickness. The number of seams in the various deposits comes to 22. The beds in the Korkinsk region are up to 150-200 meters thick; and in the Yemanzhelinsk region, 40 meters thick. In the remaining areas the bed thickness does not exceed 3-4 meters.

The coal is brown, low in sulfur content, and the moisture content is less than 25 percent. It is used as a power-generating fuel and to some extent for the production of generator gas.

The depth of the coal seams is not great; 66 percent of the extracted coal is from workings up to 150 meters in depth. Almost 60 percent of the coal is from seams having an almost flat slope. More than 65 percent of the seams are gaseous. Open-pit mining is carried out in the Korkino area; almost 40 percent of the coal extracted in the basin comes from open pits.

The deposits of Sverdlovskaya Oblast include the Serovskiy, Yegorshino, and Bulanash-Yelkinskiy coal-bearing areas, of which the Serovskiy area is the most important industrially. This area includes the Volchansk, Bogoslovsk, and Veselovsk deposits which are being intensively exploited by the open-pit method. The seam series is about 100 meters thick. The coal is brown, high in ash and moisture content, and is used as a power-generating fuel.

Yegorshino coal is semianthracite. The seams are very frequently noncontinuous and the beds are lenticular in formation.

Further development of coal output at this basin depends on overcoming the problems connected with the depth of the levels; these are complicated by slow gas discharge and sudden ejections of coal and gas.

The coal of the Bulanash-Yelkinsk deposit varies from gas in the north to long-flame in the south. Hydrogeological conditions are characterized by water-soaked strata above the coal-bearing seams.

The Lake Baikal region has a large number of coal deposits but none of any great size. Coal is being produced in the Tarbagatay, Chernovo, Arbagar, and Bukachachin deposits in Chitinskaya Oblast and on the Gusinoozersk deposit in the Buryat-Mongolian ASSR.

Bukachachinsk coal is bituminous, while that of the remaining deposits are brown. The Tarbagatay, Chernovsk, and Bukachachinsk deposits have rather poor possibilities for future development.

However, the possibilities for the Gusinoozersk, and in particular the Kharanorsk deposit, are very good. An open pit is under construction on the Kharanorsk deposit and several more are planned for construction in the future. The construction of a mine and open pit has begun in the Gusinoozersk deposit, which is 120 kilometers from Ulan-Ude, on the shores of Lake Gusiniy. Up to 20 seams have been surveyed. Seam thickness varies from one to 5 meters, with some seams up to 20 meters thick. Seam construction is complicated by interstratification of clay and slate. The coal is brown, with a 10- to 20-percent ash content.

The Kharanorsk deposit is located in the southern part of Chitinskaya Oblast. It is composed of up to ten seams; of these, the upper seams have a thickness of up to 16 meters and can be exploited by the open-pit method. The coal is brown and porous and rapidly deteriorates in outdoor storage.

In the Far East, there are coal mining operations in the Raychikhinsk deposit in Amurskaya Oblast and also on the Urgal' deposit in Khabarovskiy Kray, both of which are part of the Burenskiy basin. There are also mining operations in the numerous deposits of Primorskiy Kray in Sakhalinskaya Oblast.

The Raychikhinsk deposit lies at up to 50 meters in depth and can be exploited by the open-pit method. The deposit is made up of three horizontal coal seams, of which one has a thickness of 5-6 meters.

The coal is brown, with a 10-percent ash content and moisture content of 40 percent on a working-fuel basis. The coal is used for power-generating purposes. During the Sixth Five-Year Plan, a portion of it will be briquetted.

The Bureya Basin, of which the Urgal coal deposit is a part, is located on the upper part of the Bureya River 300 kilometers from the Far Eastern Railroad system.

The coal has an ash content of 18-27 percent. Most of the coal area is in the Urgal deposit. This coal is related to gas coal, has a high ash content, and is difficult to concentrate. However, there are possibilities that the coal can be utilized in the Amurstal' and Komsomol'sk plants in Amur.

The largest number of exploitable basins in the Far East is found in Primorskiy Kray. These include the Suchan, Lipovets, Voroshilov, and Podgorodnenskoye bituminous deposits and the Artem and Tavrichanskoye brown coal deposits. The coal in all these deposits can be extracted only by the underground method; however, there is a possibility that open-pit mining can be organized in the Lipovets deposit in the future.

The ash content of Primorskiy coal is comparatively high. Lipovets coal has an unusually high yield of volatile substances -- 50 percent.

The majority of these deposits, particularly Suchan, do not have good prospects for future development.

In the Sakhalin region, coal is mined in the Aleksandrovsk, Uglegorsk, Kholmsk, Yuzhno-Sakhalinsk, and Makarov areas. A basic characteristic of the Sakhalin area is the variety and complexity of mining and geological conditions to be found in its coal beds. The thickness of workable seams varies from 0.7 to 6 meters and more. The dip of the seams varies from horizontal to steeply pitched. The deposits are characterized by numerous geological faults, displacement of coal by rocks, and thinning-out of seams. Highly regular and consistent seams are found in the Yuzhno-Sakhalinsk and Kholmsk areas.

Coal of different grades is extracted in Sakhalin. Eighty percent of the output consists of long-flame and brown coal. There is little coking coal.

The Uglegorsk area has the best possibilities for development since its gas coal is utilized by the fleet and for power-generating purposes; a portion is coked.

The Caucasus region has many coal deposits, of which only the Tkvarcheli, Tkibuli, and Akhaltsikhe are of importance to Georgian industrial development.

The deposits are located chiefly in the mountain areas. They have complicated mining conditions; the majority of the seams must be mined by drifts and inclined shafts. Vertical shafts are used in the Akhaltsikhe Brown Coal Basin.

Gas coal is mined chiefly in Tkvarcheli and Tkibuli mines; over 50 percent of the mines extract this type of coal. The average thickness of the seams in existing mines is 2.2-2.3 meters. The seams vary in dip from almost flat to inclined. The deposits have such disturbances as breaks and faults.

The coal from all Georgian deposits is ashy. The coal from various seams in Tkibuli and Tkvarcheli is used in the coke-chemical industry. The rest is used for power-generating purposes. A considerable portion of coking coal is imported into Georgia from the Donbass. Output is to rise approximately 36 percent during the Sixth Five-Year Plan.

Coal in Central Asia is mined at present at the Kok-Yanyak, Tash-Kumyr, Kyzyl-Kiya, and Sulyukta deposits in the Kirgiz SSR; at Angren in Uzbekistan; at Shurab in Tadzhikistan; and at the Lenger deposit in Kazakhstan.

All the deposits consist of brown coal. They are located in mountainous areas and mining conditions are complicated. The seams have an average to maximum thickness of 1-6 meters, in some cases up to 12-16 meters. They dip from 12-15 degrees up to 50-70 degrees.

The majority of the seams and mines are not dangerous from the gas aspect, but the coal is subject to spontaneous combustion. The average depth of development is 200-250 meters.

Coal is mined by the open-pit method only at the Angren deposit, where the coal seam is from 30 to 60 meters thick. It has great prospects for development.

A considerable amount of coal is imported from Karaganda for the needs of the industry of Central Asia, including southern Kazakhstan. Output during the Sixth Five-Year Plan is to rise 81.6 percent.

The L'vov-Volyn Bituminous Coal Basin is located in the Southern Bug River Basin in the northwestern part of L'vovskaya Oblast and the southwestern part of Volynskaya Oblast of the Ukrainian SSR.

The seams lie at a depth of 300-600 meters and are covered by a layer of marlaceous chalk deposits from 280 to 450 meters thick. Heavy water-bearing layers are found at a depth of 120-160 meters in this layer of overburden. The influx of water from these layers into the mine shafts averages 600 cubic meters per hour, in some mines reaching 2,000 cubic meters per hour. Shaft development therefore demands special methods. Coal-bearing levels consist of one to four workable coal seams from 0.5 to 2.0 meters thick. Average thickness of the seam is 0.8-1.2 meters. The seams incline from west to southwest at an angle of 1-2 degrees.

The coal of the region is similar to the Donbass long-flame type and is a high-quality power-generating fuel.

Even though the deposits are characterized by extremely difficult hydrogeological conditions, mine construction was begun in the region because of the shortage of Donbass coal.

The Ekibastuz deposit is located in Pavlodarskaya Oblast in Kazakhstan. The South Siberian Railroad travels through the northern part of the deposit.

The deposit has a small, almost closed syncline 25 kilometers long and 9 kilometers wide. Of industrial importance are four contiguous seams of complicated construction with a thickness of from 13 to 60 meters each. The over-all thickness of the seams reaches 160 meters with a maximum depth of 350-400 meters. The coal seams come to the surface along the periphery of the syncline.

The coal is bituminous with a very high ash content of 34-45 percent and is extremely difficult to concentrate. However, its calorific value is rather high (more than 4,200 kilocalories per kilogram) and therefore this fuel is satisfactory for power-generating purposes. The coal is at present being utilized and will continue to be utilized by Ural, Omsk, and Pavlodar electric power stations.

There is at present one large open-pit in operation; two more are under construction. Three open pits with a total planned annual capacity of 20 million tons will be built during the Sixth Five-Year Plan.

The Kushmurun deposit is located in Kustanayskaya Oblast in Kazakhstan. The northern portions of the deposit run along the Kartaly-Akmolinsk railroad line.

The deposit is covered by a water-bearing layer of sand and clay from 25 to 110 meters thick. There are 21 workable seams of coal, of which the most important are the Verkhniy Moshchyy and Nizhniy Moshchnyy seams. The total thickness of these seams alone is from 23 to 35 meters.

The coal has an average ash content of from 15 to 20 percent. The moisture content varies from 26 to 36 percent on a working-fuel basis. The calorific value of the working fuel is 3,000 kilocalories per kilogram.

The deposit contains enough reserves to allow output of up to 15-20 million tons a year. The construction of five large open pits is planned during the Sixth Five-Year Plan. Kushmurun coal is principally used in the electric power stations of the Ural and Kazakhstan regions.

The Orskiy brown coal deposit is located in Aktyubinskaya Oblast of Kazakhstan. It contains up to ten seams, of which two are the most important, having a thickness of from 1-2 meters up to 9.8 meters each. The seams are in the southern part of the deposit at a depth of 8-20 meters, while in the rest of the area they are 100-150 meters in depth. The coal has an ash content of 10-30 percent and has a calorific value of up to 3,000 kilocalories per kilogram.

The southern Ural Brown Basin is located in Chkalovskaya Oblast of the Bashkirskaya ASSR. The coal-bearing area lies in the form of small disconnected deposits within which there are lenticular formations of brown, earthy coal 20-30 meters thick and sometimes up to 80 meters thick. Most of the deposits of the basin can be exploited by the open-pit method. The seams are horizontal; the thickness of the rock overburden is from 20 to 80 meters.

The coal has an ash content of 12-15 percent and its calorific value is about 2,000 kilocalories per kilogram. Two open pits have been constructed on the deposit; during the Sixth Five-Year Plan, two large mines will be built. The coal will be briquetted and also used as a power-generating fuel.

The Kansk-Achinsk basin extends along the Siberian Railroad for over 700 kilometers. The deposit is in Krasnoyarskiy Kray, while its eastern portion is in Kemerovskaya Oblast. The coal-bearing portions consist of 30 coal seams lying almost horizontally at a depth not exceeding 200 meters. A peculiarity of this basin is the presence of a coal seam 14-130 meters thick lying near the surface at a depth of 30-50 meters in various deposits of the basin.

The coal of the Kansk-Achinsk basin is principally brown, except the Barano-Partizanskiy deposit which is composed of gas coal. The brown coal is good for power-generating purposes, with a calorific value of 3,000 kilocalories per kilogram on a working-fuel basis and an ash content of 12-15 percent.

This basin is the largest in the USSR on the basis of surveyed deposits. The coal can be exploited by the open-pit method and could, therefore, be the cheapest in the country.

The largest deposits in the basin are the Borodino, Nazarovo, Bogotol, and Itat.

The Itat deposit has an upper seam 35-65 meters thick which inclines at an angle of from 2-3 to 10-15 degrees. The stripping coefficient of the deposit is 1.2 tons per cubic meter, while that of the Bogotol deposit is from one to 3 tons per cubic meter.

During the Sixth Five-Year Plan, open pits with a total annual capacity of 6-9 million tons will be constructed on the four deposits.

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